

APPENDIX 4-A

STORAGE OF THORIUM NITRATE

1. *Description.* Thorium nitrate is a radioactive, white crystalline, solid material having an appearance similar to that of table salt. It is soluble in water and alcohol and is a strong oxidizing agent. Some of the domestic produced thorium nitrate has minor amounts of nitric acid liquor inside the container. When acquired, thorium nitrate shall meet Purchase Specification BA-SP-1a (Current Edition).
2. *Packaging.* Packaging will conform to CFR 49 parts 100 to 185 Department of Transportation, (DOT) regulations and Stockpile storage requirements.
3. *Marking.* Each container will be marked to show the name of the commodity, name of producer, country of origin, gross and net weights, government contract number, lot number, and drum serial number.
4. *Storage*
 - a. The Defense National Stockpile is required to be licensed by the Nuclear Regulatory Commission before storing any radioactive material.
 - b. Thorium nitrate shall be stored in an unsprinklered or sprinklered warehouse without structural problems, and segregated from all other commodities. Warehouse sections which contain thorium nitrate shall be identified by placing radioactive identification tags on the outside of the warehouse and around the perimeter of the section containing the thorium nitrate. The first tier of drums shall be placed on floor pallets in an upright position after which one-inch thick, random length and width hardwood dunnage lumber shall be used. If the use of dunnage lumber between tiers is not practicable because of weight of drums or handling difficulties, pallets between tiers may be used. Storage identity of drummed material shall be maintained by contract number and lot number.
 - c. The drums shall be stored in uniform rows and tiers so as to facilitate the taking of inventory at any time by counting the rows and tiers and computing the total quantity. By doing this, economical use of space must be given full consideration, and segregation requirements must be met. A uniform number of drums shall be placed on each pallet, except when an odd number on the top pallet of a stack of uniform height will complete the lot.
5. *Precautions To Be Taken*
 - a. *Health.* Thorium nitrate contains radioactive elements and in view of inhalation and contact hazards, it is important that careful study be made of applicable American National Standards Institute (ANSI) publications and those published by the National Council on Radiation Protection and Measurements (NCRP). Under conditions of fire, thorium nitrate gives off dangerous and toxic fumes and should be respected in this regard, as well as for radioactive hazards. For further information refer to the material safety data sheet for this commodity and the DNSC Radiation Protection Program to insure safe handling of this material.

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b. *General.* Thorium nitrate has a tendency to pack and become somewhat cakey when exposed to air resulting in the emission of nitric acid and nitrous oxide fumes. Therefore, containers containing thorium nitrate should be inspected frequently for possible leakage or unusual forms of deterioration. Any excessive or unusual corrosion of drums containing thorium nitrate should be reported promptly to DNSC-OL.

6. *Average Storage Factor.* 13 square feet per short ton.

FOR ADDITIONAL INFORMATION ON THIS COMMODITY REFER TO THE MATERIAL SAFETY DATA SHEET OR THE MOST RECENT PURCHASE SPECIFICATION.